

ETHNO-MEDICINAL STUDY OF SOME PLANTS FROM BARAMATI AND NEARBY VILLAGES OF PUNE DISTRICT, MAHARASHTRA STATE

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ABSTRACT

Baramati is a notable Tehsil place in Pune district (Maharashtra). The people living in rural area use different herbal plants to get rid from various ailments. In the present investigation, attempts were made to collect and compile ethno-medicinal data from local herbal healers and informants. Normally, informants do not share their valuable knowledge due to fear regarding loss of medicinal effect of plant given by them. A periodic survey was carried out with villagers of Baramati, and nearby villages to record medicinal utilities of plants. 43 plants were identified and enlisted for their medicinal values to cure diseases like teeth and oral problems, jaundice, hair fall, allergic effects, impotency, piles, cold, cough, dysentery, rabbits, diabetes, kidney stone, scorpion sting, scabies and skin diseases.

Present study provides baseline data of indigenous medicinal plants that can be exploited by pharmaceutical industry to screen active principles. Plants commonly used by local knowledgeable persons for medicinal purposes are Aristolochia bracteolata Lam., Abutilon pannosum L., Calotropis procera (Ait.) R. Br., Cassia auriculata L., Cassia sophera L., Cocculus villosus DC., Momordica cymbalaria Hook.f., Emblica officinalis Gaertn., Melia azedarach L., Merremia dissecta (Jacquin) Hallier f., Pedilanthus tithymaloides (L.) Poir., Phyllanthus amrus Schum & Thonn., Ricinus communis L., Solanum xanthocarpum Schrad. & Wendl., Vitex negundo L., Withania somnifera (L.) Dunal, Indigofera linifolia (L.F.) Retz.

KEYWORDS: Baramati, Herbal Healers, Informants & Medicinal Plants

Received: Nov 16, 2019; **Accepted:** Dec 06, 2019; **Published:** Jan 04, 2020; **Paper Id.:** IJASRFEB20204

1. INTRODUCTION

Ethno-medicines includes study of traditional medicines, not only those with relevant written or published sources, but also those whose knowledge and practices have been transmitted even orally from generation to generation over the centuries. Ethno botanical surveys have been found to be one of the reliable approaches of discovering new drugs and new drug development (Sheng, 2001). Local people maintain close link between surrounding and living harmoniously with the surrounding nature. Diverse habitat of India provides immense richness in phyto-diversity of the country. About 70% India's population live in rural areas. Many rural communities in the country rely on traditional medicines for the treatment of various diseases. To improve socio-economic status of local people, it is essential to utilize available local natural resources in better scientific way.

Indigenous medicinal plants with pharmaceutical properties have received increased interest these days, from both homeopathic and allopathic branches. These medicinal plants play an important role in public health, especially in developing countries, where it is believed that the intense utilization of plants with therapeutic action does not lead to intoxication (Mossi *et.al.*, 2009). It is estimated that about 85% of traditional medicines used for

primary health care globally are derived from plants (Yadav *et. al.*, 2006). The World Health Organization estimated that 80% of the developing world population use traditional medicine (Olsen, 1998). The precious knowledge regarding local medicines is declining in the modern era. This decline is due to the fact that this significant knowledge is often transmitted from the older generation to the younger via word of mouth and most of it has not been documented (Sofowora, 1993). Comprehensive participation of local herbal-healers for documentation is the effective means of preservation of traditional medicine knowledge. It will also result in codification of best practices which can be transmitted across communities in developing countries (Van Wyk and Gericke, 2002).

India has rich past in respect to ethnomedicobotany since from *vedic* time. There has been rapid extension of allopathic system of medicinal treatment in India during the past century (Dwivedi *et. al.* 2007). However, allopathic medicines have variety side effects and people are going back to the nature with hope of safety and security. Herbal medicines are easily available, safe, cheaper, and with no fear of any side effect. Many valuable herbal drugs have been discovered by knowing that particular plant was used by ancient folk healers for the treatment of some kind of ailment (Ekka & Dixit, 2007).

The present investigation was carried out to collect precious information of indigenous medicinal plants used by people of some villages of Baramati Tehsil. Human actions that directly affect the environment cannot be seen only as negative actions, because people are part of the system and establish relationships with the environment (Araujo *et al.* 2007). By considering all the facts regarding use of local plants to cure various diseases, it was felt necessary to go through such study.

2. MATERIAL AND METHODS

Study Area: Baramati is one of the Tehsils in Pune District of Maharashtra State. It lies in eastern part of district and between 18°3' N to 18°12' N latitude and 74°13' E to 74°40' E longitude. It is located at an altitude of 548 m above mean sea level and having area 1382 sq.km. The Tehsil falls in the rain-shadow region and experiences relatively light monsoons and receive 502 mm average annual rain-fall. The Tehsil is bounded Indapur and Malshiras Tehsils towards east, Phaltan Tehsil towards south, Prandar Tehsil to west side and Daund Tehsil towards north.

The survey was carried out during 2015 to 2017 to collect information of medicinal plants used by *vaidus* (herbal healers) and villagers of Baramati, Jalochi, Rui, Sawal, Wanjarwadi, Tandulwadi, Katphal, Medad, Jainakwadi, Gojubawi, Deulgaon-Rasal and Sangavi. Extensive field visits, interviews and inquiries were conducted during study period for recording information related to medicinally important plants from study area with local participation of *vaidu*. Data presented here is based on personal observations and interviews with villager elders, herbal healers, and knowledgeable persons. The information was recorded on questionnaire and in the field note books. Photographs of plants specimen were taken by Sony digital camera (Plate 1 and 2) during the field visits. The plants were identified initially by their local names and scientific identification was done by using relevant scientific literatures (Hooker 1872–1877; Cooke 1967; Patil and Yadav 1991; Naik 1998; Singh and Karthikeyan 2000; Parrotta. 2001; Yadav and Sardesai 2002). The information available from actual conversations and observations with people is compiled in tabulated form.

3. RESULTS AND DISCUSSIONS

The survey recognized 43 ethno-medicinal plants, belonging 29 families (Table 1) used by the people of Baramati and nearby villages for the treatment of various ailments. Data available from actual field visits, interviews and inquiries with

questionnaire including, botanical name, family, local name, part used and medicinal uses from people is shown in the table. Similar uses of some medicinal plants were observed by Gupta *et. al.* (2010); Heda (2012). The rural people from Khatav tehsil use various plants to treat different ailments and diseases (Jagtap *et. al.*, 2013).

Photographs of some important plants are given in Plate I and II. The survey also showed that members of the family Euphorbiaceae (five species) are the most commonly used plants in this area by the herbal healers, followed by Asteraceae, Caesalpiniaceae, Lamiaceae, Meliaceae, Menispermaceae, Moraceae, Papaveraceae, Papilionaceae, Solanaceae and Verbinaceae (two species each), while the remaining 18 families had one species each. Knowledgeable healers are using these plants to cure various health concerns like blisters, burns, carbuncles, cough, dengue, diabetes, digestion improvement, dysentery, ear-ache, fever, hair fall, impotency, insect bite, jaundice, lactation, loose motion, filaria, pain of muscles, piles, purgative, rabies, red-rashes, rheumatism, scabies, seminal debility, skin diseases, swelling of cheeks, thorn removal from foot, tooth ache, ulcers, urine disorder and urine/kidney stone. In this investigation, Jaundice was frequent ailment followed by diabetes, health of hair, impotency, urine disorder, urine stone and wound healing treated with a variety of local medicinal plants.

For the treatment of human and animal ailments, herbal healers use specific plant parts in specific doses, sometimes in specific combinations. The plant parts used for medicinal purposes were Roots (three species), Rhizome (one species), Tuber (one species), Bulb (one species), Stem or shoot (seven species), Leaves (seventeen species), Flowers (two species), Fruits (five species), Seeds (three species) and shoot latex (one species). Most commonly used plant parts were leaves (39.53%). The leaves are most physiologically active and the center of biosynthesis of different metabolites, which may contain many bioactive principles that have good medicinal properties (Silambarasan *et. al.*, 2017). This is not surprising, considering that a single plant species may contain several chemical compounds that may be active against a wide array of diseases (Njume *et. al.*, 2011). The herbal drugs are consumed as raw, fresh juice, decoction, paste, oil, pills or dried powder form. The doses are taken orally or applied externally on affected areas. Majority therapeutic plants used are dicotyledons (40 species). Generally, fresh plant parts are preferred to use for medicinal purpose and only on unavailability dried parts are also used. Most of medicinal plants were used alone as simple drug and some plants were used in combination with other plants.

During the survey, following plants were frequently mentioned by the villagers and traditional herbal healers, e.g. *Aloe vera* (L.) Burm.f., *Aristolocia bracteolata* Lam., *Boerhavia diffusa* L., *Calotropis procera* (Ait.) R. Br., *Cassia auriculata* (L.) Dunal, *Cocculus villosus* DC., *Ficus benghalensis* L., *Ocimum sanctum* L., *Punica granatum* L., *Tinospora cordifolia* (Willd.) Miers, *Vitex negundo* L., *Tridax procumbens* L. and *Withania somnifera* (L.) Dunal.

4. CONCLUSIONS

The present investigation revealed that local people of Baramati and nearby villages are still using medicinal plants for veterinary and human purpose. The study area is rich in use of traditional and herbal medicines available in surrounding with various ethno-medicinal applications. The survey also exhibit co-existence of people with their environment as well and local medicinal plants play crucial role in the primary health care requirements of the local people. The villagers of study area not only trust, but also depend on traditional medicines prescribed by knowledgeable elders or *Vaidus* (herbal healers). The information compiled by the survey regarding the medicinal plants used by rural people of Baramati Tehsil needs comprehensive phytochemical and pharmacological toxicological investigations. The phytochemical study of plants for medicinal principles and screening by team of skilful persons, pharmacologists and medical experts may give proper

idea to local people about collection, processing and conservation of important plants. This could help in development of new plant based drugs. Such research activities will also help in awareness of local community and new generation towards the need of conservation of such important plant species, documentation of indigenous knowledge regarding medicinal utilities of local plant and also in the spreading of ethno-medicinal knowledge among the people. The dwellers of study area should be recognized as collaborators in the process of documentation to enhance the relationship between the researchers and local traditional healers. Such coexisting relationship will help for management strategy in future regarding utilization of local flora.

5. ACKNOWLEDGEMENT

Authors are very much thankful to informers and villagers of Baramati and nearby villages, especially Popat Shende, Sakharabai Ghadgei, Indubai Wable, Balasaheb Bhapkar, Nivriti Thorat, Balasahe Kamble, Nanasaheb Pawar, Asha Rodage, Vijay Pawar, Yogita Rodage and Vishwanath Kumbhar for their valuable support, active participation and personal involvement during the survey.

REFERENCES

1. Araujo E. L, Castro C. C and Albuquerque U. P (2007) *Dynamics of Brazilian Caatinga - A review concerning the plants, environment and people. Functional Ecosystems and Communities* 1, 15–28.
2. Cooke T (1967) (Rpr.). *The Flora of Presidency of Bombay. Vol. II. Botanical Survey of India. Calcutta.*
3. Dwivedi S. N, Shrivastava Satyaendra, Dwivedi Sangeeta, Dwivedi Abhishek, Dwivedi Sumeet and Kaul Shefali (2007) "Relevance of medicinal herbs used in traditional system of medicine", *Farmavita. Net.*
4. Ekka R. N and Dixit V. K (2007) "Ethno-pharmacognostical studies of medicinal plants of Jaspur District, Chattisgaeh", *Int. Jour. of Green Phar.* 1(1): 2–4.
5. Gupta R, Vairale M. G, Deshmukh R. R, Chaudhari P. R, Wate S. R (2010) "Ethnomedicinal uses of some plants by Gond tribe of Bhandara district, Maharashtra". *India Journal of Traditional Knowledge*, 9 (4), pp 713–717.
6. Heda N. K (2012) "Folk conservation practices of the Gond tribe of Mendha (Lekha) village of centera India". *India Journal of Traditional Knowledge*, 11 (4), pp 727–732.
7. Hooker J. D (1872–1977) *The flora of British India. Vol. I – VII. London.*
8. Jagtap D. K, Patil H. S and Jakhi P. S (2013), "Ethno-medicinal survey of some plants from villages of Khatav tahashil (M.S.)", *Int. J. Life Sciences*, Vol. I(4), pp 264–269.
9. Naik V. N (1998) *Flora of Marathwada. Vol. I & II, Amurt Prakashan, Aurangabad.*
10. Njume C, Afolayan A. J, Ndip RN (2011) "Diversity of plants used in the treatment of *Helicobacter pylori* associated morbidities in the nkonkobe municipality of the Eastern Cape Province of South Africa." *J. Med Plants Res.*, 5:3146–51.
11. Olsen C. S (1998) *The trade in medicinal and aromatic plants from central Nepal to Northern India. Econ. Bot.*, 52:279–92.
12. Parrotta John A (2001) *Healing Plants of Peninsular India. CABI Publishing USA.*
13. Patil H. S and Yadav S. R (1991) *Preliminary Survey of Khatav Tehsil. M.Phil. Theses, Shivaji Uni. Kolhapur.*
14. Sheng-Ji P (2001) "Ethnobotanical approaches of traditional medicine studies: Some experiences from Asia." *Pharm. Biol.*, 39 Suppl 1:74–9

15. Vinodia, S., & Dixit, A. K. (2017). Angiospermic Flora of Echanakmar-Amarkantak Biosphere Reserve, Central India. *International Journal of Botany and Research (ijbr) issn (p)*, 2277–4815.
16. Silambarasan R, Sureshkumar J, Krupa J, Amalraj S, Ayyanar M (2017) "Traditional herbal medicines practiced by the ethnic people in Sathyamangalam forests of Western Ghats, India." *Eur. J. Integr. Med.*, 16:61–72.
17. Singh N. P and Karthikeyan S (2000) *Flora of Maharashtra state, Vol. 1–3. Botanical Survey of India. Calcutta.*
18. Sofowora A (1993) *Medicinal Plants and Traditional Medicine in Africa. 2nd ed. Ibadan, Nigeria: Spectrum Books.*
19. Thokchom, R., Hanglem, A., Zimisai, S., & Anel, T. C. Documentation and Assessment of Wild Medicinal and Edible Flowers of Valley Districts of Manipur.
20. Van Wyk B. E, Gericke N (2002) "People's Plants: A Guide to Useful Plants of Southern Africa." Pretoria: Briza Publications.
21. Yadav J. P, Kumar S, Siwach P (2006) "Folk medicine used in gynecological and other related problems by rural population of Haryana." *Indian J. Tradit. Know.*, 5:323–6.
22. Yadav SR and Sardesai MM (2002) *Flora of Kolhapur District. Shivaji University Press, Kolhapur.*
23. Begum, S. S., Raju, K., & Gangadhar, B. Medicinal and Phytochemical Properties of Selected Native Plants of Andhra Pradesh: A Review.

APPENDIX

Table 1: List of Medicinal Plants used by the Villagers of the Baramati Tehsil for the Treatment of Various Ailments

Sl. No.	Botanical Name	Family	Local Name	Part Used	Medicinal Uses
1	<i>Abutilon pannosum</i> L.	Malvaceae	Kasli	Leaves	5–6 fresh leaves given in scorpion sting, twice a day.
2	<i>Allium cepa</i> L.	Alliaceae	Kanda	Bulb	Bulb juice is poured in nose for dizziness and in ear for ear-ache.
3	<i>Aloe vera</i> (L.) Burm.f.	Liliaceae	Korpad	Leaf gel	Warm leaf gel is employed on blister, hair fall and in rheumatism.
4	<i>Argemone Mexicana</i> L.	Papaveraceae	Bilayat	Root Bark	Bark of root given with betel- leaf in jaundice
5	<i>Aristolocia bracteolata</i> Lam.	Aristolochiaceae	Gandhak	Leaves	Fresh juice is employed on wounds in animals to remove wound worms and to heal wound.
6	<i>Azadiracta indica</i> Juss.	Meliaceae	Kadulimb	Leaves	Leaf paste is on scabies and ring worm, ash with water used to remove urine-stone.
7	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Punarnava	Shoot	Fresh shoot extract with empty stomach early in the morning on jaundice.
8	<i>Butea monosperma</i> (Lam.) Taub.	Papilionaceae	Palas	Flowers	Soak flowers overnight in water, crush flowers in same water and drink it for diabetes.
9	<i>Calotropis procera</i> (Ait.) R. Br.	Asclepidaceae	Rui	Latex	To remove thorns from legs, to stop coughing of ox latex is poured in nose.
10	<i>Capparis zeylanica</i> L.	Capparidaceae	Waghathi	Leaves	A glass of leaf juice is mixed in 5 liter water and drink entire water within a day to fall urine stone
11	<i>Carica papaya</i> L.	Caricaceae	Papai	Leaves	Fresh leaf juice given in dengue and viral fevers.

Table 1: Contd.,					
12	<i>Cassia auriculata</i> (L.) Dunal	Caesalpiniaceae	Tarwad	Flowers	To cure carbuncle in nose flowers are inhaled
13	<i>Cassia sophora</i> L.	Caesalpiniaceae	Kasawda	Leaves	Leaf juice is employed on red rashes due to marking-nut allergy.
14	<i>Celosia argentea</i> L.	Amaranthaceae	Kurdu	Tender shoot	Vegetable is given in indigestion and as purgative.
15	<i>Citrus limon</i> (L.) Burm.f.	Rutaceae	Idlimbu	Fruit	Fresh juice of fruit in empty given on kidney stone.
16	<i>Cocculus villosus</i> DC.	Menispermaceae	Vasanvel	Leaves	Fresh juice of leaves in dysentery and diarrhea. Juice is also given in jaundice and seminal debility.
17	<i>Coriandrum sativum</i> L.	Apiaceae	Kothimbir	Shoot	Fresh juice is applied on bald to reappear new hair.
18	<i>Emblica officinalis</i> Gaertn.	Euphorbiaceae	Awala	Leaves and fruits	Leaf ash mixed in oil and applied on burns, paste of fresh fruits used to prevent hair-fall.
19	<i>Ferronia elephantum</i> Corr.	Rutaceae	Kawath	Leaves	Dried powders of leaves and <i>Calotropis</i> flower in equal quantity. One spoon mixture with cow milk for three month in impotency.
20	<i>Ficus benghalensis</i> L.	Moraceae	Wad	Apices of stem	Dried powders of extreme shoot apices and tubers of turmeric soaked in cow urine are mixed well; make paste in cow-urine and pills of the paste given on impotency to women.
21	<i>Ficus racemosa</i> L.	Moraceae	Umbar	Leaves and fruits	Leaf insect galls are given on mouth ulcer, fruits given to promote lactation and in diabetes.
22	<i>Glossocardia bosvallea</i> (L. f.) DC.	Asteraceae	Ran Shepu	Leaves	Fresh leaves used to cure throat.
23	<i>Indigofera linifolia</i> (L.F.) Retz.	Papilionaceae	Phandhar Phali	Seeds	Boiled seeds are taken orally on piles.
24	<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	Jangli Erand	Stem and leaves	Fresh latex applied to seals and heals sharp cut wounds.
25	<i>Lantana camara</i> L.	Verbinaceae	Tantani	Leaves and fruits	Two drops of juice is poured in ear to stop tooth ache. Black ripened fruits are eaten in piles.
26	<i>Lawsonia inermis</i> L.	Lythraceae	Mehndi	Stem bark	Pinch of powder is given to dissolve and to fall urine stone
27	<i>Melia azedarach</i> L.	Meliaceae	Bijoura Limb	Roots	Powder made on stone is given for 31 days in rabies, one spoon with water every day.
28	<i>Mentha spicata</i> L.	Lamiaceae	Pudina	Leaves	Leaves chewing on tongue ulcer and scorpion sting.
29	<i>Merremia dissecta</i> (Jacquin) Hallier f.	Convolvulaceae		Leaves	Two to three fresh leaves directly chewing to control blood sugar in diabetes.
30	<i>Momordica cymbalaria</i> Hook.f.	Cucurbitaceae	Kadwanchi	Tuber	Paste of tuber is applied on piles to get instant relief.
31	<i>Ocimum sanctum</i> L.	Lamiaceae	Tulas	Leaves	Equal parts of leaves, ash (<i>Bhasm</i>) and camphor mix well, one spoon every day on <i>Naru</i> (filariasis).

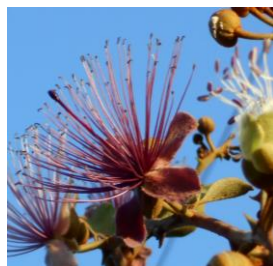
Table 1: Contd.,

32	<i>Pedilanthus tithymaloides</i> (L.) Poir.	Euphorbiaceae		Leaves	2-3 fresh leaves, early in the morning for piles.
33	<i>Phyllanthus amarus</i> Schum & Thonn.	Euphorbiaceae	Bhui-awala	Roots	Fresh roots with milk given in jaundice and urine disorders.
34	<i>Piper betle</i> L.	Piperaceae	Khaycha Pan	Leaves	Fresh leaf juice is applied before bathing in scabies.
35	<i>Punica granatum</i> L.	Punicaceae	Dalimb	Leaves and fruit rind	Cup of leaf juice with sugar used to control loose motion, Rind powder reduce urination.
36	<i>Ricinus communis</i> L.	Euphorbiaceae	Erand	Leaves and oil	Warm leaves are tied on paining muscles, oil is recommended to lick on bulging of stomach in babies.
37	<i>Solanum xanthocarpum</i> Schrad. & Wendl.	Solanaceae	Bhuiringani	Seeds and roots	Seed smoke on toothache and swelling of cheeks, before rising sun. Root decoction is useful on urine disorders.
38	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Jambhul	Seeds	Seed paste is applied on blisters and scars caused due to new chappal/ shoes. One spoon powder made from seeds and dried Amala fruits with cow milk early in the morning for 20 days on diabetes.
39	<i>Tinospora cordifolia</i> (Willd.) Miers	Menispermaceae	Gulwel	Leaves and stem	Leaf/stem juice given in different types of fever.
40	<i>Tridax procumbens</i> L.	Asteraceae	Kutkuti	Shoot	Leaf juice on wounds to heal and to prevent pus formation, also applied at insect bite.
41	<i>Vitex negundo</i> L.	Verbinaceae	Nirgudi	Leaves	Warm leaves are tied on swelling of muscles and in rheumatism. Leaves, turmeric powder & salt: Chewing and applied on eye hurt of animals.
42	<i>Withania somnifera</i> (L.) Dunal	Solanaceae	Ashwagandha	Stem and root	Wreath of stem pieces is worn in jaundice, roots given to animals to increase digestive capacity.
43	<i>Zingiber officinale</i> Rosc.	Zingiberaceae	Ale	Fresh Rhizome	2 inch ginger, 2 medium sized onion, one spoon black paper, 250g <i>khadisakhar</i> grind well, add sufficient cow ghee, after proper soaking take one spoon of the mixture for cough, 3 time a day

Plate I



Pedilanthus tithymaloides (L.)



Capparis zeylanica L.,



Vitex negundo L.,



Momordica cymbalaria Hook.f.,

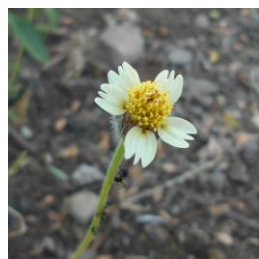
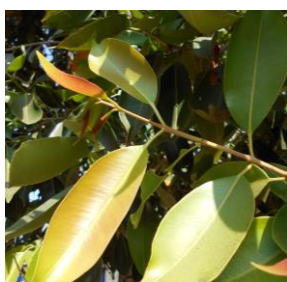
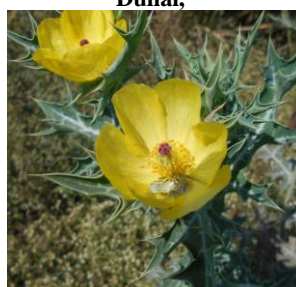
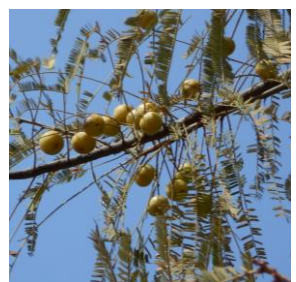
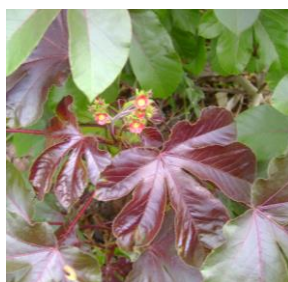
*Withania somnifera* (L.)*Abutilon pannosum* L.,*Tridax procumbens* L.,*Solanum xanthocarpum*
Schrad. & Wendl.,*Melia azedarach* L.,*Ricinus communis* L.,*Cassia sophera* L.,*Cocculus villosus* DC.

Plate II

*Cassia auriculata* (L.)
Dunal,*Syzygium cumini*
(L.) Skeels,*Punica granatum* L.,*Calotropis procera* (Ait.) R.
Br.,*Argemone Mexicana* L.,*Azadiracta indica* Juss.,*Merremia dissecta* (Jacquin)
Hallier f.,*Ficus racemosa* L.,*Emblica officinalis* Gaertn.,*Butea monosperma* (Lam.)
Taub.,*Phyllanthus amarus* Schum &
Thonn.*Jatropha gossypifolia* L.

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